



AMSAT-NA

# GUIDE FOR DESIGNING THE NEXT AMSAT SATELLITE

VERSION 1.0

OCTOBER 26, 2014

Presented by:

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## Design The Next AMSAT Satellite! - Checklist

The following is a checklist of information that is considered necessary in a submission per the request for ideas for the design of the next AMSAT satellite.

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### Overview

The idea you are proposing must not simply be a suggestion of what AMSAT “should do”. We are seeking a thorough high-level design which encompasses everything from concept to launch type. Because we are all volunteers working together toward amateur radio satellite communications, we are asking for and expect your involvement in the design you submit. While I can only offer limited input on your design, please feel free to contact me regarding the content of your proposal so that we can make the best of the opportunity.

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### Strategy

- Describe how the purpose and implementation of this idea fits into AMSAT-NA Engineering’s long term strategy and the AMSAT-NA mission “keeping amateur radio in space”.
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### AMSAT Engineering’s Long Term Strategy

- Advancement of amateur radio satellite technical and communications skills
  - Enhance international goodwill
  - Grow and sustain a skilled pool of amateur radio satellite engineers
  - Establish and maintain partnerships with educational institutions
  - Develop a means to use hardware common to all opportunities
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### Design and Implementation

The design should include the following details.

- The RF design, such as modes, bands, antennas, ground station requirements, telemetry design, and link budget.
- The power system design, including batteries, solar panels, power supply, battery chargers, and power output.
- The CubeSat configuration, i.e. 1U, 3U, 6U. This should also include any references to modularity or expandability per the AMSAT long term strategy.
- Science, Technology, Engineering, and Math (STEM) education payloads, including details of the type of payload, purpose of the payload, telemetry requirements, payload sponsor, and an overview of the education plan.
- Propulsion, including type, capability, purpose, and source. Propulsion will require a waiver process.
- Thermal design considerations.

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## Cost and Resources

- A proposed plan of execution including manpower estimates with source (e.g. existing or recruited volunteers, or paid contractors), total manpower cost to complete such a project in the given timeline (e.g. number of volunteers and man hours for volunteers or cost estimates for hired work), the sources of unusual components and materials for the project, maturity of the components, and cost estimates for components and materials.

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## Timeline

- A timeline for a project which includes startup such as recruiting and requirements documentation, the execution of the design, construction, testing, and delivery stages and taking into account the capabilities and delivery of partner payloads and components, technology development, acquisition of components/materials, and acquisition of licenses such as NOAA imaging and IARU/FCC licensing.

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## Launch Opportunity

- The method of launch including desired orbit, launch provider (if specifically required), whether the launch proposed is an ELaNa candidate, and the substantially higher cost and source of funding for a commercial launch. If you intend to seek an ELaNa launch, please be familiar with the ELaNa Announcement of CubeSat Launch Initiative information so that your submission would meet the necessary criteria.
- Compliance with U.S. Government Orbital Debris Mitigation Standard Practices and NASA Technical Standard NASA-STD-8719.14A (with Change 1).

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## Risk Factors

- Provide an assessment of the risk involved in the execution and implementation of the idea including probability of success, technological (e.g. propulsion), volunteer manpower, and financial risks.

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## Partnerships (STEM experiments or materials/technology)

- Develop any partnerships with universities or other educational institutions through the AMSAT Vice President – Engineering.
- Establish a commitment to delivery contingent upon the acceptance of your proposal.
- Describe the resources and their purpose in the project.

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## Deliver Your Idea to AMSAT

### Submit your idea to the AMSAT Vice President - Engineering

- After you have completed the work, mail the proposal to

**AMSAT VP ENGINEERING**

10605 CONCORD ST.

KENSINGTON, MD 20895

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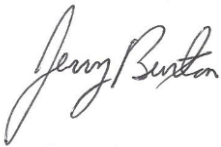
## NOTICE TO FOREIGN NATIONALS

Due to United States International Traffic in Arms Regulations and Export Administration Regulations, discussions during the development of your ideas may be limited in scope due to export rules. We hope you understand this situation.

Upon acceptance of your proposal, AMSAT will seek authorization to conduct work with you on a project in a complete and proper manner.

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I would like to thank you for your interest in helping to design the next AMSAT satellite! I look forward to working with you.



Jerry Buxton, NØJY

Vice President - Engineering

Radio Amateur Satellite Corp.

(AMSAT)

### Document History

DATE	VERSION	CHANGES
October 26, 2014	1.0	Original